

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE**

AMPEX CORPORATION,

Plaintiff,

V.

EASTMAN KODAK COMPANY,
ALTEK CORPORATION, and
CHINON INDUSTRIES, INC.,

Defendants.

C.A. No. 04-1373 (KAJ)

**DECLARATION OF CHARLES G. BONCELET, JR. IN SUPPORT OF
AMPEX CORPORATION'S CLAIM CONSTRUCTION BRIEF**

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May 23, 2006

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

AMPEX CORPORATION,)	
)	
<i>Plaintiff,</i>)	
)	
v.)	C.A. No. 04-1373-KAJ
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EASTMAN KODAK COMPANY,)	
ALTEK CORPORATION, and)	
CHINON INDUSTRIES, INC.,)	
)	
<i>Defendants.</i>)	
)	

DECLARATION OF CHARLES G. BONCELET, JR.

I, Charles G. Boncelet, declare as follows:

1. I understand that this Declaration is being submitted in conjunction with Plaintiff Ampex Corporation's Claim Construction Brief. Unless specifically indicated otherwise, this Declaration is made based on personal knowledge.

2. As set forth in my resume (attached hereto at Exhibit A), I am currently a professor in the Departments of Electrical & Computer Engineering (ECE) and Computer & Information Sciences (CIS) at the University of Delaware. My primary research interests are in the fields of image and signal processing, computer networking, data compression, multimedia, and digital watermarking, and steganography.

3. I earned my Bachelor's degree in Applied and Engineering Physics from the Cornell University in 1980.

4. I earned my Master's degree in Electrical Engineering and Computer Science from Princeton University in 1981.

5. I earned my Doctorate in Electrical Engineering and Computer Science from Princeton University, 1984.

6. I began work as a professor in the ECE and CIS Departments at the University of Delaware in 1984. As a professor in the ECE and CIS departments, I have more than 20 years of experience in the fields of image and signal processing.

7. Over the past twenty years, I have taught courses in multimedia, signals and systems, digital and analog circuit theory, digital signal processing, and information theory. I have also supervised more than 25 graduate students in fields related to image and signal processing.

8. I have also published or presented over ninety articles related to image and signal processing. A complete listing of my publications is attached hereto at Exhibit A

9. I have also served as the Chair of various conferences related to image and signal processing, and have served as a reviewer for various journals and textbooks in those fields (including the IEEE Transactions on Signal Processing, Information Theory, Image Processing, Automatic Control, and Signal Processing Letters.)

10. I am a member of the Institute of Electrical and Electronics Engineers (IEEE), the Society for Industrial and Applied Mathematics (SIAM), The Association for Computing Machinery (ACM), the American Society of Engineering Education (ASEE), the Delaware Academy of Science, Eta Kappa Nu, and Tau Beta Pi.

11. I have also been awarded two patents in the field of signal processing.

12. I understand Ampex has defined the term “video image” to mean “an electronic signal representation of visual information displayable in visual form on a monitor or other display device.”

13. In my opinion, this is consistent with the understanding one of ordinary skill in the art would have of this term based upon the ‘121 patent disclosure.

14. I understand that Ampex has defined the terms “the video pixel data” (and its variants in the ‘121 patent claims) to mean “data (or data sets) representing the same image as the antecedent data (or data sets).” I further understand that Ampex has construed these terms such that: “subsequent to its initial generation, video pixel data representing a video image may be further processed or transformed (e.g., to conform to different representation conventions, to enhance the representation of the image, or to compress the data), and as such is still properly characterized as the video pixel data representing the video image.”

15. These constructions are consistent with what a person of ordinary skill in the art of the ‘121 patent would understand these limitations to mean.

16. As described with respect to the preferred embodiment of the ‘121 patent, video images are captured by the disclosed video still store system from a video input circuit, such as “another still store system, a TV camera, or some other source of video data.” (‘121 patent 2:65-3:1)

17. The video input circuit includes both “appropriate video signal decoding means to process video data received from sources that provide the data in an encoded form,” as well as the circuitry necessary to provide a video signal or video data to the described still store system.

18. The analog video signal provided by the video input circuit is transferred to an Analog to Digital converter, which converts the data for the video image into “a digital form that is suitable for handling and processing by digital circuitry.” (‘121 patent, 3:12-19)

19. Thus, the ‘121 patent discloses that data representing digital images should be encoded in a format appropriate to the intended use of the data.

20. In the preferred embodiment, this digital data represents the image in terms of “pixels,” each of which is “represented by three eight bit data bytes defining respectively luminance, red chrominance, and blue chrominance components.” (‘121 patent, 3:20-24)

21. A “pixel” is a picture element that is used to represent the video image. Commonly, each pixel is described, in the most basic sense, in terms of a color and an intensity value.

22. The particular color of a given pixel can be characterized using various formats. The format used for representing the color of digital pixel data in terms of measurable values is often referred to by those of skill in the art as a “color space.”

23. As one of ordinary skill in the art at the time of the ‘121 patent application would have understood, different color spaces could be used interchangeably to represent the color values of images comprised of digital pixel data. From the time of the ‘121 patent application to the present, a number of additional color space representations have been introduced and come into common usage.

24. One common form of color space used for representing digital pixel data at the time of the ‘121 patent application is the RGB color space.

25. In the RGB (i.e. “Red,” “Green,” “Blue”) color space, the color of each of the pixels comprising a digital video image is represented by three values, one of which sets forth the amount of red for the color of the pixel, the second the amount of green, and the third the amount of blue. Each of these individual values is referred to as a “color component.”

26. These color component values, when combined in the appropriate manner, provide the color for the pixel. The complete range of colors that can be accurately represented by a given color space based on the combination of the various color components is referred to as the “gamut” of that color space.

27. The ‘121 patent describes various processing steps performed on the digital data representing images captured by the system in addition to color space encoding.

28. For example, the ‘121 patent expressly discloses the use of compression for digital data representing video images encoded in YCbCr format. Data compression techniques were well known at the time of the ‘121 patent application. Such compression techniques could be “lossless,” meaning that there was no loss of data in the compression/decompression process, or it could be “lossy,” meaning that some data was lost in the compression/decompression process. The type of compression disclosed in the ‘121 patent was lossy compression.

29. The particular form of lossy image compression described in the ‘121 patent is subsampling of chrominance data:

The input AD 14 receives the video signal from the video input 12 and converts the video signal to the digital sampled data form in which each pixel of video data is represented by three eight bit data bytes defining respectively luminance, red chrominance and blue chrominance components. *Conventionally, the chrominance data has half the spatial resolution of the luminance data in the horizontal dimension.* ... The single byte representation affords a high dynamic resolution of 256 distinguishable states for each color component. For adequate dynamic resolution, each video component at a sampled data point is preferably defined by at least 6 binary bits providing 64 distinguishable intensities.

(‘121 patent 3: 16-34) (emphasis added).

30. Thus, as described in the ‘121 patent, chrominance data is only captured for every other pixel. This lossy compression takes advantage of the fact that the human eye is less sensitive to color than it is to luminance, and so even though color is measured at half the sampling rate as luminance, the human eye does not detect the difference.

31. Moreover, as one of ordinary skill in the art would have known, NTSC television broadcast equipment, including the types of equipment that would have been employed as a video input circuit, typically compressed chrominance signals by eliminating high frequency components to which the human visual system is insensitive.

32. Thus, one of ordinary skill in the art, in reviewing the ‘121 patent disclosure, would have understood that such lossy compression would commonly have been performed in the video input circuit prior to transfer to and storage in the disclosed still store system.

33. The above quoted portion of the ‘121 patent also describes the use of varying bit resolutions for each of the color components for a given pixel. The reference to “high dynamic resolution of 256 distinguishable states for each color component” is to a sampling precision of eight bits per digital data sample, and the

reference to “adequate dynamic resolution, each video component at a sampled data point is preferably defined by at least 6 binary bits providing 64 distinguishable intensities” is to a sampling precision of six bits per digital data sample. (‘121 patent 3: 16-34) Thus, the ‘121 patent expressly teaches that the bit resolution should be selected according to the desired dynamic resolution for the intended use of the data. I.e., the patent teaches that data can be discarded in order to save on memory storage requirements, at the cost of reduced image resolution, or vice versa. Again, this is a form of lossy compression. Indeed, one of ordinary skill in the art would have recognized that the very process of converting an analog video signal to a digital format (as performed in the preferred embodiment ‘121 patent) is lossy.

34. One of ordinary skill in the art, in reviewing the ‘121 patent disclosure, would have understood that this lossy compression would commonly have been performed in the video input circuit prior to transfer to and storage in the disclosed still store system.

35. As disclosed in the ‘121 patent, after the analog signal representing a video image has been converted into the appropriate digital format for handling and processing, this digital pixel data representing the image is stored in a framestore, which in the preferred embodiment is comprised of random access memory. (‘121 patent 3:47-49, 66-68).

36. After generation of data representing a reduced resolution copy of the video image, the video data representing the image is “transferred from frame store ... to disk store ... for more permanent storage.” (‘121 patent, 4:16-19). In the preferred embodiment, the disk store is a “general purpose magnetic disk storage system as [was]

currently used with general purpose digital computing systems.” (‘121 patent 2:29-31; 4:23-27)

37. As one of ordinary skill in the art would understand in reviewing the ‘121 patent, during this process of transferring the data for the video image, the data actually recorded on the magnetic disk storage system would not be mathematically identical to the data for the video image as stored in the framestore, because data as stored on a magnetic hard disk would be encoded using formats appropriate for more permanent storage of large amounts of data, and to reduce data errors occurring during the recording process.

38. In connection with the formation of my opinions, I have reviewed documents that describe the details of formats used for encoding data stored on magnetic disk drives as used in the 1983 time frame, as well as the expert report and direct testimony of George Ligler from the ITC investigation between Ampex and Kodak.

39. For example, AX204954-73, AX210465-67, and AXD024625-38 are a set of articles that describe forms of encoding used on magnetic hard disks in the 1983 timeframe. I understand that these documents are included in Exhibits 13-16, attached to the Declaration of Dr. George T. Ligler, which declaration is also being submitted in support of Ampex’s Claim Construction Brief.

40. As of 1983, one of the prevalent forms of encoding data storage on magnetic disk drives was run length limited, or RLL encoding. RLL encoding was designed to format data in such a way as to provide for a reduction in decoder errors, particularly errors that would result from long string of one’s or zero’s. In so doing, RLL

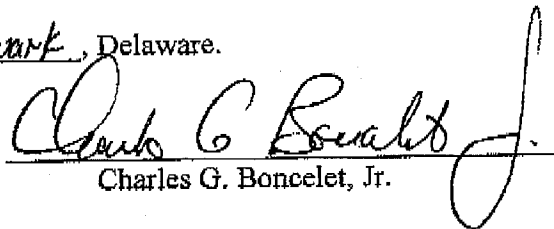
encoding would significantly change the actual bits recorded on the magnetic disk drive from their original form.

41. Thus, as one of ordinary skill in the art would have understood when reading the disclosure of the '121 patent, the exact numerical representations of data representing a digital image as recorded on the magnetic disc storage would have been completely different from the numerical representation of the data as stored in a frame store, at least on account of the encoding used to store the data on a magnetic storage device.

42. One of ordinary skill in the art would further have recognized that, in spite of the differences in numerical representation and encoding method, the '121 patent still referred to the data representing the image as stored in the framestore, and the data representing the image as stored in the magnetic disc storage, as the same data for the image; and further would have recognized that the '121 patent characterized the image as stored in the framestore and as stored in the magnetic disc storage as the same image.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this 22 day of May, 2006, at Newark, Delaware.


Charles G. Boncelet, Jr.

CERTIFICATE OF SERVICE

I, Julia Heaney, hereby certify that on May 23, 2006, I caused to be electronically filed the foregoing with the Clerk of the Court using CM/ECF, which will send notification of such filing(s) to the following:

Paul M. Lukoff, Esquire
David E. Brand, Esquire
Prickett, Jones & Elliott, P.A.

and that I caused copies to be served upon the following in the manner indicated:

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